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Agricultural Memorandum No. 577

Pigs in Transit - Completed Analysis of Deaths.

L P Smith

Using the data of Ag Mem 576, and smoothing the data in overlapping triplets of temperature ranges by the use of weighting factors $\frac{1}{2}$, 1 and $\frac{1}{2}$, a complete analysis can be attempted. This smoothing is justified by the fact that the exact time of travel of the pigs is not known and could easily involve temperatures within 1°C of the daytime mean used as the classification basis.

The resulting deaths per thousand for deaths on arrival (DOA), deaths in pens with minimum data adjustment (DIP_1) and the deaths in pens for a subjective adjustment (DIP_2) are given in the Appendix, together with the sums $\text{DOA} + \text{DIP}_1$ and $\text{DOA} + \text{DIP}_2$. As in the preliminary analysis the August to December figures are lower than those for January to July in the higher temperature ranges.

Both sets of months show a certain behavioural pattern, namely:-

Range -5°C to 8°C .

Deaths almost independent of temperature with DIP values exceeding DOA.

8°C to 15°C .

Slow increase of DOA, with temperature and a rapid increase beyond.

8°C to 17°C .

Slow increase of DIP_1 and DIP_2 with temperature with rapid increase beyond.

HYPERBOLIC

~~Parabolic~~ curves can be fitted to the total deaths per 1000,

January - July

$$\frac{0.12X + 14.4}{28.2 - X}$$

August - December

$$\frac{0.046X + 12.7}{27.5 - X}$$

Where X =

mean daytime temperature

with a fair degree of accuracy up to 25 or 26°C .

Any comments or suggestions on this paper should be referred to the author.

September 1973

Meteorological Office
Bracknell.

APPENDIX

Range mid point	<u>January to July</u>					<u>August to December</u>				
	Deaths per 1000					Deaths per 1000				
	DOA	DIP ₁	DIP ₂	DOA + DIP ₁	DOA + DIP ₂	DOA	DIP ₁	DIP ₂	DOA + DIP ₁	DOA + DIP ₂
-3.5	0.18	0.18	0.24	0.35	0.42					
-2.5	0.22	0.34	0.34	0.55	0.55					
-1.5	0.24	0.39	0.34	0.62	0.57	0.40	0.32	0.22	0.72	0.62
-0.5	0.23	0.30	0.28	0.53	0.51	0.21	0.25	0.18	0.46	0.39
+0.5	0.27	0.29	0.29	0.56	0.55	0.14	0.28	0.27	0.42	0.41
1.5	0.28	0.34	0.32	0.62	0.60	0.16	0.29	0.34	0.45	0.50
2.5	0.28	0.37	0.36	0.65	0.64	0.19	0.28	0.33	0.47	0.51
3.5	0.29	0.38	0.38	0.67	0.67	0.25	0.28	0.28	0.53	0.53
4.5	0.28	0.36	0.36	0.64	0.64	0.28	0.31	0.31	0.59	0.59
5.5	0.28	0.34	0.34	0.63	0.63	0.28	0.32	0.36	0.61	0.64
6.5	0.29	0.34	0.34	0.62	0.62	0.29	0.36	0.37	0.65	0.65
7.5	0.29	0.32	0.33	0.61	0.62	0.30	0.43	0.40	0.73	0.70
8.5	0.32	0.30	0.32	0.62	0.63	0.33	0.45	0.43	0.78	0.76
9.5	0.35	0.33	0.33	0.68	0.68	0.38	0.41	0.42	0.80	0.80
10.5	0.40	0.40	0.40	0.79	0.80	0.41	0.41	0.42	0.82	0.83
11.5	0.44	0.44	0.43	0.88	0.88	0.40	0.42	0.40	0.82	0.81
12.5	0.46	0.47	0.46	0.92	0.92	0.43	0.43	0.41	0.86	0.84
13.5	0.49	0.53	0.51	1.02	1.00	0.47	0.46	0.45	0.93	0.92
14.5	0.54	0.55	0.53	1.09	1.07	0.50	0.48	0.47	0.98	0.96
15.5	0.62	0.56	0.55	1.18	1.17	0.58	0.49	0.50	1.07	1.08
16.5	0.76	0.58	0.60	1.34	1.35	0.69	0.51	0.53	1.20	1.22
17.5	0.89	0.61	0.64	1.50	1.53	0.76	0.56	0.57	1.32	1.33
18.5	1.01	0.67	0.70	1.68	1.71	0.83	0.67	0.64	1.50	1.47
19.5	1.16	0.78	0.79	1.94	1.95	0.94	0.74	0.72	1.69	1.67
20.5	1.34	0.94	0.93	2.28	2.27	1.13	0.77	0.80	1.90	1.93
21.5	1.41	1.09	1.07	2.50	2.48	1.38	0.83	0.88	2.21	2.26
22.5	1.46	1.47	1.36	2.93	2.82	1.68	1.05	1.04	2.73	2.72
23.5	2.03	2.47	2.24	4.50	4.28	2.12	1.38	1.35	3.50	3.47
24.5	3.35	3.45	3.20	6.80	6.55					
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27.5	14.20	5.28	6.09	19.48	20.29					